

Applicant : Claire Hartmann-Thompson  
Appln. No. : 10/694,027  
Page : 2

### REMARKS

Claims 1-20 are pending in the above-identified application. However, claims 11-20 have been withdrawn from consideration. Upon reconsideration and recognition of the allowable subject matter, it is believed that claims 11-20 should be considered for rejoinder into the application.

Claims 1-10 remain pending and under consideration in the application.

#### Rejection Under 35 U.S.C. §102

Claims 1-10 stand rejected under 35 U.S.C. §102(b) as being anticipated by Zheng et al., "X-ray Characterizations of Polyethylene Polyhedral Oligomeric Silsesquioxane Copolymers," *Macromolecules*, 2002, 35, 2375-2379 (hereinafter referred to as "Zheng").

According to the Examiner, Zheng discloses the use of polyhedral oligomeric silsesquioxane (POSS) nanoparticles polymerized with copolymers to create a new stable polymer. The Examiner further alleges that POSS-containing copolymers of Zheng have higher mechanical and thermal properties than polymers without POSS side units. With respect to claim 4, the Examiner alleges that "it would have been obvious to one having ordinary skill in the art to modify McGill to employ an inert filler such as clay or glass fiber because this would make the polymer matrix stable and not have side reaction with the sample of interest."

Initially, it must be pointed out that obviousness and the teachings of McGill are not relevant to a rejection under 35 U.S.C. §102(b) based on Zheng. Presumably this statement is an unintended artifact from the previous Office Action. Accordingly, Applicant will assume that claims 1-10 are rejected under 35 U.S.C. §102(b) as anticipated by Zheng.

The Examiner's opening statement that Zheng discloses polyhedral oligomeric silsesquioxane nanoparticles polymerized with copolymers is incorrect. Zheng actually discloses copolymerization of polyhedral oligomeric silsesquioxane (POSS) nanoparticles with polyethylene backbones to form a polyethylene-co-POSS copolymer. Next, the Examiner states that the copolymers employed are polysiloxane. This statement is only correct to the extent that Zheng discloses that others have previously obtained copolymers of POSS and polysiloxane. Zheng does not actually employ a polysiloxane.

Applicant : Claire Hartmann-Thompson  
Appln. No. : 10/694,027  
Page : 3

The Examiner has correctly stated that Zheng suggests that the polyethylene-co-POSS copolymers have higher mechanical and thermal properties than polymers without POSS side units. However, this statement is not of any relevance with respect to the claimed invention, which is directed to a composite material for sensing an analyte, wherein the composite comprises a polymer matrix and a solid particulate filler dispersed in the polymer matrix, the solid particulate filler having functional groups capable of interacting with the analyte. The claims are not directed to copolymers in which the polymeric backbone is covalently bonded to a solid particulate filler, but rather to a composite material in which a solid particulate filler is physically dispersed within a polymer matrix. It is well known in the art that a solid particulate filler that is dispersed in a polymer matrix is not covalently bonded to the polymer matrix, and that such composite is not the same as or equivalent to a copolymer as disclosed by Zheng.

Further, the rejection fails to address the important limitation that the solid particulate filler has functional groups capable of interacting with an analyte. The POSS nanoparticles that are copolymerized with the polyethylene backbones have either methacrylate or styrene (X in Figure 1) groups that are capable of polymerizing with the polyethylene backbones. The resulting copolymer does not have any functional groups that are capable of interacting with an analyte, either on the polyethylene portion of the copolymer or on the POSS portion of the copolymer. Consequently, the polyethylene-co-POSS copolymers disclosed by Zheng do not anticipate the claimed composite material.

It is noted that the POSS material used by Zheng include pendant R groups that may be, for example, cyclopentyl or cyclohexyl groups. These cycloaliphatic groups are inert, and are not capable of interacting with an analyte.

Thus, Zheng fails to anticipate the claimed invention because it does not disclose a composite material comprising a polymer matrix and a solid particulate filler dispersed in the polymer matrix, and does not disclose particulate fillers having functional groups capable of interacting with an analyte.

The fact that Zheng discloses copolymers having higher mechanical and thermal properties than the polyethylene polymers of which it is comprised does not provide any reason for not making the copolymer, but instead dispersing the POSS nanoparticles in a polymer

Applicant : Claire Hartmann-Thompson  
Appln. No. : 10/694,027  
Page : 4

matrix. Similarly, the suggestion that the Zheng copolymers have higher mechanical and thermal properties than polyethylene does not give the person of ordinary skill in the art any reason to modify the POSS particles so that they include functional groups that are capable of interacting with an analyte.

The rather substantial differences between the claimed invention and the polyethylene-co-POSS copolymers of Zheng, and the differences in the properties and functions of the respective materials strongly suggest that the claimed invention is not obvious based on Zheng. Clearly, the invention is not anticipated by Zheng.

The Examiner's statement that the specification (at page 6) discloses that Applicant's polymer matrix is a polysiloxane and that the preferred solid filler particles are POSS is meaningless with respect to patentability of the claims. Zheng does not disclose a composite comprising a polymer matrix containing solid filler particles nor a material capable of sensing an analyte, but instead discloses an inert copolymer of polyethylene and POSS nanoparticles. Thus, rather than disclosing each of the required claim limitations, Zheng actually does not disclose any of the claim limitations.

The claimed invention requires different materials from those disclosed by Zheng, which are arranged in a manner different from the way the materials of Zheng are arranged.

#### CONCLUSION

In view of the above remarks, the application is in condition for allowance and notice of the same is requested.

Respectfully submitted,

April 21, 2008

Date

GJE/dac

/Gunther J. Evanina/

Gunther J. Evanina, Registration No. 35 502  
Price, Heneveld, Cooper, DeWitt & Litton, LLP  
695 Kenmoor, S.E.  
Post Office Box 2567  
Grand Rapids, Michigan 49501  
(616) 949-9610